U.S. Department of Energy
Office of River Protection
P.O. Box 450, MSIN H6-60
Richland, Washington 99352

JUL 17 2007

0073323

07-ESQ-108

Ms. Jane A. Hedges, Program Manager
Nuclear Waste Program
State of Washington
Department of Ecology
3100 Port of Benton Blvd.
Richland, Washington 99354

RECEIVED
JUL 18 2007
EDMC

Dear Ms. Hedges:

SUBMITTAL OF HANFORD FACILITY RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) PERMIT MODIFICATION NOTIFICATION FORM 24590-PTF-PCN-ENV-06-018

Reference: Hanford Facility Resource Conservation and Recovery Act Permit (WA7890008967) Part III, Operating Unit 10, Unit Specific Conditions, Waste Treatment and Immobilization Plant.

This letter transmits Hanford Facility RCRA Permit Modification Notification Form 24590-PTF-PCN-ENV-06-018 (Attachment 1) for the Washington State Department of Ecology (Ecology) review and approval. The Form describes a requested Class 1 modification to the Reference related to the Pretreatment Facility (PTF) at the Waste Treatment and Immobilization Plant. A Bechtel National, Inc. certification statement is provided in Attachment 2.

Permit Modification Notification Form 24590-PTF-PCN-ENV-06-018 updates the Mechanical Data Sheets for the PTF Waste Feed Vessels (24590-PTF-MV-FRP-VSL-00002A/B/C/D) found in Appendix 8.6 of the Reference.

This modification request was discussed in advance with your staff. If you have any questions, please contact me, or your staff may contact Gae M. Neath, Office of Environmental Safety and Quality, (509) 376-7828.

Sincerely,

Shirley J. Olinger, Acting Manager
Office of River Protection

ESQ:GMN

Attachments: (2)

cc: See page 2

cc w/attachs:
Administrative Record
Environmental Portal, LMSI

cc electronic:
J. M. Atwood, BNI
W. S. Elkins, BNI
B. G. Erlandson, BNI
P. A. Fisher, BNI
J. S. Hill, BNI
D. X. Klein, BNI
S. Murdock, BNI
J. Cox, CTUIR
S. Harris, CTUIR
B. Becker-Khaleel, Ecology
R. K. Biyani, Ecology
K. Elsethagen, Ecology
E. A. Fredenburg, Ecology
T. A. Williams, Ecology
S. A. Thompson, FHI
G. Bohnee, NPT
A. C. McKarns, RL
R. Jim, YN

cc w/o attachs:
M. Anderson-Moore, Ecology
L. Cusack, Ecology
S. L. Dahl, Ecology
G. P. Davis, Ecology
A. A. Hamar, Ecology
K. Niles, Oregon Energy

Attachment 1
07-ESQ-108

Hanford Facility RCRA Permit Modification Notification Form
24590-PTF-PCN-ENV-06-018

Quarter Ending June 30, 2007 24590-PTF-PCN-ENV-06-018

Hanford Facility RCRA Permit Modification Notification Form

Part III, Operating Unit 10

Waste Treatment and Immobilization Plant

Index

Submitted by Co-Operator:

D. A. Klein 6/27/07
D. A. Klein Date

Reviewed by ORP Program Office:

S. J. Clinger 7/16/07
S. J. Clinger Date

Quarter Ending June 30, 2007 24590-PTF-PCN-ENV-06-018

Hanford Facility RCRA Permit Modification Notification Form	
Unit: **Waste Treatment and Immobilization Plant**	Permit Part & Chapter: **Part III, Operating Unit 10**

Description of Modification:

The purpose of the modification is to update four PTF mechanical data sheets for Waste Feed Receipt Vessels 24590-PTF-MV-FRP-VSL-00002A/B/C/D, identified as 24590-PTF-MVD-FRP-P0005/6/7/8 in Appendix 8.6 of the Dangerous Waste Permit (DWP). The following source mechanical data sheets are submitted to replace the permit data sheets currently in Appendix 8.6:

- Mechanical Data Sheet: Vessel (24590-PTF-MVD-FRP-00005, Rev 10)
- Mechanical Data Sheet: Vessel (24590-PTF-MVD-FRP-00006, Rev 10)
- Mechanical Data Sheet: Vessel (24590-PTF-MVD-FRP-00007, Rev 10)
- Mechanical Data Sheet: Vessel (24590-PTF-MVD-FRP-00008, Rev 10)

The above mentioned mechanical data sheets include revisions as indicated by revision triangles shown on the documents. The revisions shown are the result of ongoing design. The significant changes are provided as follows:

- The following footnote (indicated by a double asterisk) was added to the actual weight and seismic based moment in the Design Data Section:
  "The actual weights and the seismic base moment shown herein are based on the original seismic data and these figures are subject to change, based on the new loads obtained from the seismic redesign."

- Clarified the third paragraph in the Hydrodynamic Loading Section (which describes the plot)

  from: "Overblow loads vary as a function of the distance from the center of the overblowing pulse jet mixer nozzle and the elevation "H" above the overblowing pulse jet mixer nozzle as plotted"

  to: "Overblow loads vary as a function of the distance from the center of the overblowing pulse jet mixer nozzle and the elevation "H" above the overblowing pulse jet mixer nozzle up to the overflow level as plotted in the form of overblow pressures"

  The plot is not changing this is an informational change only.

- Reworded the paragraph in the Hydrodynamic Loading Section below the plot

  from: "The overblow pressure shall only be applied to the projected area of the overblowing pulse jet mixer in the vertical, upward direction and to all surrounding components in the horizontal plane, radiating from the overblowing pulse jet mixer. Seller shall consider that any single pulse jet mixer may overblow 100 cycles."

  to: "For all vessel internal components other than the overblowing pulse jet mixer, the overblow forces shall be applied a) in the vertical direction, and b) in the horizontal direction, radiating from the centerline of the overblowing pulse jet mixer. For the overblowing pulse jet mixer, the force shall be applied in the vertical upward direction only. The overblow force on all components, including the structure and supports, shall be calculated by applying the overblow pressure at the location of the nearest surface of the components and to the projected area of the component, facing the appropriate direction. The normal force component, specified for the normal pulse jet mixer operation condition, is not applicable to the overblow condition. Any single pulse jet mixer may overblow 1000 cycles. Reference CCN 125541

Quarter Ending June 30, 2007 24590-PTF-PCN-ENV-06-018

dated 7/27/05."

This revision results in the vessel being functionally equivalent or upgraded due to accounting for vertical forces from PJM overblows on vessel internal components. Additionally, the vessel will now be designed for 1000 cycles from a single pulse jet mixer overblow instead of 100.

There are no outstanding change documents associated with these mechanical data sheets.

Please replace the following in Appendix 8.6 of the dangerous waste permit.

Appendix 8.6			
Replace:	24590-PTF-MVD-FRP-P0005, Rev. 3	With:	24590-PTF-MVD-FRP-00005, Rev. 10
	24590-PTF-MVD-FRP-P0006, Rev. 3		24590-PTF-MVD-FRP-00006, Rev. 10
	24590-PTF-MVD-FRP-P0007, Rev. 3		24590-PTF-MVD-FRP-00007, Rev. 10
	24590-PTF-MVD-FRP-P0008, Rev. 3		24590-PTF-MVD-FRP-00008, Rev. 10

WAC 173-303-830 Modification Class: [1] [2]	Class 1	Class [1]1	Class 2	Class 3
Please mark the Modification Class:	X			

Enter Relevant WAC 173-303-830, Appendix I Modification citation number: A.1 and A.3

Enter wording of WAC 173-303-830, Appendix I Modification citation:

A.1. Administrative and informational changes

A.3. Equipment replacement or upgrading with functionally equivalent components (e.g., pipes, valves, pumps, conveyors, controls)

Modification Approved: ☐ Yes ☐ No (state reason for denial)	Reviewed by Ecology:
Reason for denial:	B. Becker-Khaleel / Date

[1] Class 1 modifications requiring prior Agency approval.

[2] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to a Class '1, if applicable.

MECHANICAL DATA SHEET: VESSEL

R10637275

PLANT ITEM No.
24590-PTF-MV-FRP-VSL-00002A

Project:	**RPP-WTP**	P&ID:	**24590-PTF-M6-FRP-00001**
Project No:	**24590**	Calculations:	**24590-PTF-MVC-FRP-00001, 24590-PTF-MTC-FRP-00001** 10
Project Site:	**Hanford**	Vessel Drawing	**24590-PTF-M2-FRP-00001**
Description:	**Waste Feed Receipt Vessel**		

~~ISSUED BY~~
RPP-WTP PDC

Reference Data

Charge Vessels (Tag Numbers)	
Pulsejet Mixers / Agitators (Tag Numbers)	**FRP-PJM-00061, FRP-PJM-00062, FRP-PJM-00063, FRP-PJM-00064, FRP-PJM-00065, FRP-PJM-00066, FRP-PJM-00067, FRP-PJM-00068, FRP-PJM-00069, FRP-PJM-00070, FRP-PJM-00071, FRP-PJM-00072**
RFDs/Pumps (Tag Numbers)	

Design Data

Quality Level		**See Drawing**	Fabrication Specs	**24590-WTP-3PS-MV00-T0001**		
Seismic Category		**SC-I**	Design Code	**ASME VIII Div 1**		
Service/Contents		**Radioactive Liquid**	Code Stamp	**Yes**		
Design Specific Gravity		**1.46**	NB Registration	**Yes**		
Maximum Design Volume	gal	**406,800 (Note 6)**	Weights (lbs)	Empty	Operating	Test
Total Volume	gal	**474,000 (Note 6)**	Estimated	**592,900**	**5,550,000 (Note 3)**	**4,550,000**
Viscosity	cP	**1.58 min / 21 max**	Actual ** 10	**589,800**	**5,370,000**	**4,540,000**
Environmental Qualification 10		**N/A**				

Inside Diameter	inch	**564**			Wind Design	**Not Required**	
Length/Height (TL-TL)	inch	**312**			Snow Design	**Not Required**	
		Vessel Operating	Vessel Design	Coil/Jacket Design	Seismic Design	**24590-WTP-3PS-SS90-T0001** **24590-WTP-3PS-MV00-T0002**	
Internal Pressure	psig	**ATM**	**15**	**NA**	Seismic Base Moment ** 10	ft*lb	**46,070,000**
External Pressure	psig	**0.123**	**2.5**	**NA**	Post weld Heat Treat	**Not Required**	
Temperature	°F	**215**	**240**	**NA**	Corrosion Allowance	inch	**0.04 (Note 11)**
Min. Design Metal Temp.	°F	**5**			Hydrostatic Test Pressure *	psig	**19.5**

Materials of Construction

Component	Material	Minimum Thickness / Size	Containment
Top Head	**SA 240 316 (Note 2)**	**See Drawing**	**Auxiliary (Note 1)**
Shell	**SA 240 316 (Note 2)**	**See Drawing**	**Primary (Note 1)**
Bottom Head	**SA 240 316 (Note 2)**	**See Drawing**	**Primary (Note 1)**
Support (Skirt)	**SA 240 304 (Note 2)**	**See Drawing**	**N/A**
Internals	**SA 240 316 / SA 479 316 (Note 2)**	**See Drawing**	**Thermocouples Primary (Note 1)**
Pipe	**SA 312 TP316 Smls (Notes 2 & 7)**	**See Drawing**	**Note 1**
Forgings/ Bar stock	**SA 182 F316 (Note 2)**	**See Drawing**	**N/A**

Miscellaneous Data

Orientation	**Vertical**	Support Type	**Skirt**
Insulation Function	**Not Applicable**	Insulation Material	**Not Applicable**
Insulation Thickness (inch)	**Not Applicable**	Internal Finish	**Note 4**
		External Finish	**Welds Descaled as Laid**

* As determined by the vendor. 10

** The actual weights and the seismic base moment shown herein are based on the original seismic data and these figures are subject to change, based on the new loads obtained from the seismic redesign. 10

	MECHANICAL DATA SHEET: VESSEL	PLANT ITEM No. 24590-PTF-MV-FRP-VSL-00002A

Remarks

Note 1: *All welds forming part of the primary and auxiliary containments, including the nozzle attachment welds shall be subjected to 100% volumetric examination.*

Note 2: *Maximum carbon content of 0.030% for all welded components.*

Note 3: *Operating weight includes weight of liquid filled to top of overflow nozzle.*

Note 4: *Descale all internal welds as laid, grind smooth and blend all starts/stops, high spots, and crevices, finish welds as required for NDE purposes.*

Note 5: *Revised PJM operating pressure and number of cycles per CCN 053810, specified content viscosity.*

Note 6: *Vessel volumes are approximate and do not account for manufacturing tolerances, nozzles, and displacement of internals.*

Note 7: *Welded pipe may be used for 14" NPS PJM supports per 24590-WTP-SDDR-PROC-03-0154.*

Note 8: *This vessel is located in a Black Cell.*

Note 9: *Contents of this document are Dangerous Waste Permit affecting (internal use only).*

Note 10: *Piping and piping support configurations shall be designed to preclude natural frequencies less than 7.0 Hz.*

Note 11: *Seller shall ensure that an additional 0.044" is available for erosion in the spherical portion of the bottom head and shall report the minimum thickness required for all specified loading conditions, exclusive of erosion and corrosion allowances.* GND 128549 & 10/28/05

Note 12: *Revision 10 of this data sheet incorporates the CCN 129149. The CCN added the words "in the form of overblow pressures", to the note shown above the overblow loads graph and further revised the note below the graph, as noted herein on sheet 3 of 5. Added calculation 24590-PTF-MTC-FRP-00001 and Environmental Qualification on Sheet 1. Added the note identified by ** on sheet 1.*

	MECHANICAL DATA SHEET: VESSEL	PLANT ITEM No. 24590-PTF-MV-FRP-VSL-00002A

Equipment Cyclic Data Sheet

Plant Item Number:	***24590-PTF-MV-FRP-VSL-00002A***
Description	***Parent Vessel***

The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.

Materials of Construction	***SA 240 316 with maximum carbon content of 0.030%***
Design Life	***40 years***
Component Function and Life Cycle Description	***This vessel receives and stores waste in a batch transfer from off-site tanks. It shall be designed to be filled to the maximum content level over a period of one day. Additionally, this vessel will be subjected to fluid dynamic forces from the operation of the pulse jet mixers during the process of suspending the solids in the waste feed. This vessel is washed down not more than once per year.***

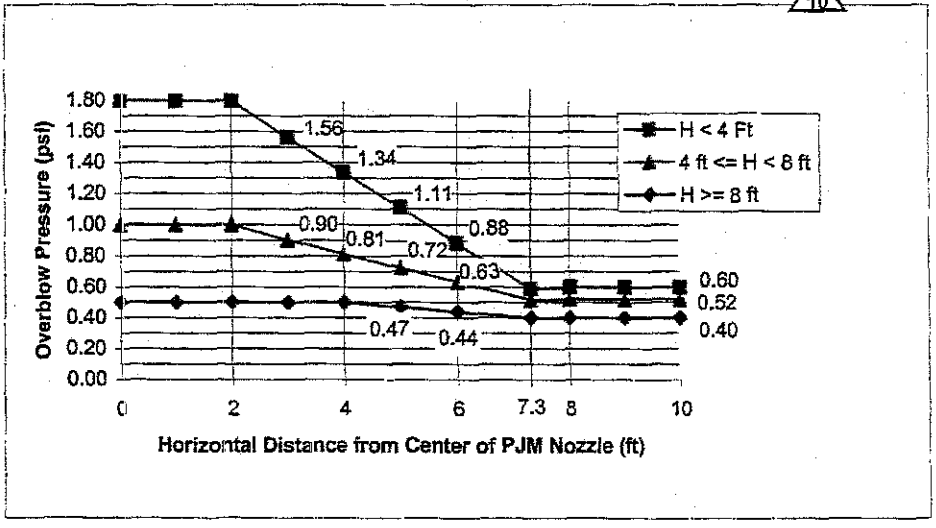
Load Type		Range		Number of Cycles	Comment
Design Pressure	psig	***-2.5***	***15***	***10***	***Nominal assumption for testing***
Operating Pressure	psig	***-0.123***	***0***	***5100***	
Operating Temperature	°F	***50***	***215***	***5100***	
Contents Specific Gravity		***1.0***	***1.46***	***5100***	
Contents Level	inch	***32***	***402***	***5100***	***Liquid level measured from crown of bottom head***
Localized Features					
Nozzles					
Supports		***Same as vessel***		***Number of cycles same as vessel***	

Hydrodynamic Loading

In normal operation, pulse jet mixers discharge liquid into the parent vessel imposing a cyclical hydrodynamic load on all internal components. Occasionally, an upset condition designated 'overblow' causes air to be discharged from any single pulse jet mixer. All internal components shall be designed for the combination of the normal operational hydrodynamic loads and overblow loads, and this load combination is also to be assumed to act concurrently with seismic loads.

Normal operation imposes a cyclical load ranging between -0.05 and 0.12 psi in the radial direction and -0.01 to 0.10 psi in the vertical direction for 8.0 x 10^6 cycles. The hydrodynamic pressure applies across the projected area of the component. Positive hydrodynamic forces act in the radial, outward direction and the vertical, upward direction. Seller shall apply the radial load simultaneously in the radial direction and normal to the radial direction in the horizontal plane.

Overblow loads vary as a function of the distance from the center of the overblowing pulse jet mixer nozzle and the elevation 'H' above the overblowing pulse jet mixer nozzle up to the overflow level, as plotted in the form of overblow pressures: 10



10

For all vessel internal components other than the overblowing pulse jet mixer, the overblow forces shall be applied a) in the vertical direction, and b) in the horizontal direction, radiating from the centerline of the overblowing pulse jet mixer. For the overblowing pulse jet mixer, the force shall be applied in the vertical upward direction only. The overblow force on all components, including the structures and supports, shall be calculated by applying the overblow pressure at the location of the nearest surface of the component and to the projected area of the component, facing the appropriate direction. The normal force component, specified for the normal pulse jet mixer operation condition, is not applicable to the overblow condition. Any single pulse jet mixer may overblow 1000 cycles. Reference CCN 125541 dated 07/27/05.

	MECHANICAL DATA SHEET: VESSEL	PLANT ITEM No. 24590-PTF-MV-FRP-VSL-00002A

Notes

Cycle increase: The Seller must increase the numbers of operational cycles given above by 10% to account for commissioning duty unless otherwise noted.

Remarks (Continued From Sheet 1)

Equipment Cyclic Data Sheet

Component Plant Item Number:	***24590-PTF-MV-FRP-PJM-00061, 24590-PTF-MV-FRP-PJM-00062, 24590-PTF-MV-FRP-PJM-00063, 24590-PTF-MV-FRP-PJM-00064, 24590-PTF-MV-FRP-PJM-00065, 24590-PTF-MV-FRP-PJM-00066, 24590-PTF-MV-FRP-PJM-00067, 24590-PTF-MV-FRP-PJM-00068, 24590-PTF-MV-FRP-PJM-00069, 24590-PTF-MV-FRP-PJM-00070, 24590-PTF-FRP-MV-PJM-00071, 24590-PTF-MV-FRP-PJM-00072***
Component Description:	***Pulse Jet Mixer Vessels (PJM)***

The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.

Materials of Construction	***SA 240 316 with maximum carbon content of 0.030%***
Design Life	***40 years***
Component Function and Life Cycle Description	***These PJMs are cyclically loaded using vacuum to fully fill the PJM with process liquid and compressed air to fully empty the PJM. The PJMs are contained within a parent vessel with varying liquid level. They shall be designed to cycle between the maximum pressure and the minimum pressure plus the external static head imposed by the parent vessel.*** ***The PJM supports shall be designed to cycle between the following loading conditions depending on the liquid level in the parent vessel:*** ***Fully Buoyant*** — ***Parent vessel full and PJM empty*** • ***Design for buoyancy + PJM thrust – PJM weight*** ***PJM Weight*** — ***Parent vessel full and PJM full or Parent vessel nearly empty and PJM empty*** • ***Design for PJM weight*** ***Fully Loaded*** — ***Parent vessel nearly empty and PJM full*** • ***Design for PJM weight + liquid weight***

Load Type		Range		Number of Cycles	Comment
Design Pressure	psig	***FV***	***80***	***10***	***Nominal assumption for testing***
Operating Pressure	psig	***FV***	***30***	***8.0 X 10⁶***	***Operating pressure = 22 psig + 8 psig design margin***
Operating Temp	°F	***50***	***215***	***<100***	
Contents Specific Gravity		***1.0***	***1.46***	***<1000***	
Contents Level	inch	***Empty***	***Flooded***	***8.0 X 10⁶***	
PJM Thrust	lbf	***0***	***330***	***8.0 X 10⁶***	
Localized Features					
Supports		***Fully Buoyant***	***PJM Weight***	***3.31 X 10⁶***	***The parent vessel is operating at greater than 75% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.***
		Fully Buoyant	***Fully Loaded***	***1.38 X 10⁶***	***The parent vessel is operating at between 25 and 50% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.***
		PJM Weight	***Fully Loaded***	***3.31 X 10⁶***	***The parent vessel is operating at less than 25% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.***

Notes

Cycle increase: The Seller must increase the numbers of operational cycles given above by 10% to account for commissioning duty unless otherwise noted.

BECHTEL	**MECHANICAL DATA SHEET: VESSEL**	PLANT ITEM No. ***24590-PTF-MV-FRP-VSL-00002A***

Approval

Rev	Description	System Engr	Vessel Engr	Checked	Approved	Date
0	**Issue for Purchase**	Y. Hovanski	R. Simmons	C. Slater/CEC	S. Kirk	4/18/02
1	**Revised as Noted**	Y. Hovanski	R. Simmons	C. Corriveau	S. Kirk	6/02/02
2	**Revised Cyclical Data**	Y. Hovanski	R. Simmons	C. Slater	S. Kirk	8/29/02
3	**Revised as Noted, Deleted Charge Vessels**	Y. Hovanski	R. Simmons	CS / JJ	M.Hoffmann	12/13/02
4	**Revised per Note 5**	Y. Hovanski	R. Simmons	CS / JJ	M.Hoffmann	5/16/03
5	**Revised per Note 7**	Y. Hovanski	R. Simmons	CS / JJ	M.Hoffmann	11/3/03
6	**Added Black Cell Requirements**	R. Rider	R. Simmons	YH/CS/JJ	M. Hoffmann	4/5/04
7	**Added Material Specification for Internal Supports and Hydrodynamic Loads**	R. Rider	R. Simmons	YH/RT/JJ D. Adler	M. Hoffmann	6/23/04
8	**Revised Hydrodynamic Loading Criteria**	R. Rider	R. Simmons	YH/CS/JJ	M. Hoffmann	7/13/04
9	**Revised Hydrodynamic Loading Criteria**	R. Rider	R. Simmons	CS/JJ	M. Hoffmann	7/20/04
10	**Revised per Note 12 on sheet 2 of 5.**					10/28/05

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

MECHANICAL DATA SHEET: VESSEL

R10637276

PLANT ITEM No.
24590-PTF-MV-FRP-VSL-00002B

Project:	**RPP-WTP**	P&ID:	**24590-PTF-M6-FRP-00001**
Project No:	**24590**	Calculations:	**24590-PTF-MVC-FRP-00001, 24590-PTF-MTC-FRP-00001** 10
Project Site:	**Hanford**	Vessel Drawing	**24590-PTF-M2-FRP-00002** MMS 10/28/05
Description:	**Waste Feed Receipt Vessel**		

ISSUED BY RPP-WTP PDC

Reference Data

Charge Vessels (Tag Numbers)	
Pulsejet Mixers / Agitators (Tag Numbers)	**FRP-PJM-00017, FRP-PJM-00018, FRP-PJM-00019, FRP-PJM-00020, FRP-PJM-00021, FRP-PJM-00022, FRP-PJM-00023, FRP-PJM-00024, FRP-PJM-00025, FRP-PJM-00026, FRP-PJM-00027, FRP-PJM-00028**
RFDs/Pumps (Tag Numbers)	

Design Data

Quality Level		**See Drawing**			Fabrication Specs	**24590-WTP-3PS-MV00-T0001**	
Seismic Category		**SC-I**			Design Code	**ASME VIII Div 1**	
Service/Contents		**Radioactive Liquid**			Code Stamp	**Yes**	
Design Specific Gravity		**1.46**			NB Registration	**Yes**	
Maximum Design Volume	gal	**406,800 (Note 6)**			Weights (lbs)	Empty	Operating	Test
Total Volume	gal	**474,000 (Note 6)**			Estimated	**592,900**	**5,550,000 (Note 3)**	**4,550,000**
Viscosity	cP	**1.58 min / 21 max**			Actual ** 10	**589,800**	**5,370,000**	**4,540,000**
Environmental Qualification 10		**N/A**						

Inside Diameter	inch	**564**			Wind Design	**Not Required**	
Length/Height (TL-TL)	inch	**322**			Snow Design	**Not Required**	
		Vessel Operating	Vessel Design	Coil/Jacket Design	Seismic Design	**24590-WTP-3PS-SS90-T0001** **24590-WTP-3PS-MV00-T0002**	
Internal Pressure	psig	**ATM**	**15**	**NA**	Seismic Base Moment ** 10	ft*lb	**46,070,000**
External Pressure	psig	**0.123**	**2.5**	**NA**	Postweld Heat Treat	**Not Required**	
Temperature	°F	**215**	**240**	**NA**	Corrosion Allowance	inch	**0.04 (Note 11)**
Min. Design Metal Temp.	°F	**5**			Hydrostatic Test Pressure *	psig	**19.5**

Materials of Construction

Component	Material	Minimum Thickness / Size	Containment
Top Head	**SA 240 316 (Note 2)**	**See Drawing**	**Auxiliary (Note 1)**
Shell	**SA 240 316 (Note 2)**	**See Drawing**	**Primary (Note 1)**
Bottom Head	**SA 240 316 (Note 2)**	**See Drawing**	**Primary (Note 1)**
Support	**SA 240 304 (Note 2)**	**See Drawing**	**N/A**
Internals	**SA 240 316 / SA 479 316 (Note 2)**	**See Drawing**	**Thermocouples Primary (Note 1)**
Pipe	**SA 312 TP316 Smls (Notes 2 & 7)**	**See Drawing**	**Note 1**
Forgings/ Bar stock	**SA 182 F316 (Note 2)**	**See Drawing**	**N/A**

Miscellaneous Data

Orientation	**Vertical**	Support Type	**Skirt**
Insulation Function	**Not Applicable**	Insulation Material	**Not Applicable**
Insulation Thickness (inch)	**Not Applicable**	Internal Finish	**Note 4**
		External Finish	**Welds Descaled as Laid**

*** As determined by the vendor.** 10

**** The actual weights and seismic moment , shown herein are based on the original seismic data and these figures are subject to change, based on the new loads, obtained from the seismic redesign.** 10

BECHTEL	MECHANICAL DATA SHEET: VESSEL	PLANT ITEM No. 24590-PTF-MV-FRP-VSL-00002B

Remarks

Note 1: *All welds forming part of the primary and auxiliary containments, including the nozzle attachment welds shall be subjected to 100% volumetric examination.*

Note 2: *Maximum carbon content of 0.030% for all welded components.*

Note 3: *Operating weight includes weight of liquid filled to top of overflow nozzle.*

Note 4: *Descale all internal welds as laid, grind smooth and blend all startsistops, high spots, and crevices, finish welds as required for NDE purposes.*

Note 5: *Revised PJM operating pressure and number of cycles per CCN 053810, specified content viscosity.*

Note 6: *Vessel volumes are approximate and do not account for manufacturing tolerances, nozzles, and displacement of internals.*

Note 7: *Welded pipe may be used for 14" NPS PJM supports per 24590-WTP-SDDR-PROC-03-0154.*

Note 8: *This vessel is located in a Black Cell.*

Note 9: *Contents of this document are Dangerous Waste Permit affecting (internal use only).*

Note 10: *Piping and piping support configurations shall be designed to preclude natural frequencies less than 7.0 Hz.*

Note 11: *Seller shall ensure that an additional 0.044" is available for erosion in the spherical portion of the bottom head and shall report the minimum thickness required for all specified loading conditions, exclusive of erosion and corrosion allowances.* CCN 128549 04/18/2006

Note 12: *Revision 10 of this data sheet incorporates the CCN 129149. The CCN added the words "in the form of overblow pressures", to the note shown above the overblow loads graph and further revised the note below the graph, as noted herein on sheet 3 of 5. Added calculation 24590-PTF-MTC-FRP-00001 and Environmental Qualification on Sheet 1. Added the note identified by ** on sheet 1.*

10

	MECHANICAL DATA SHEET: VESSEL	PLANT ITEM No. 24590-PTF-MV-FRP-VSL-00002B

Equipment Cyclic Data Sheet

Component Plant Item Number:	***24590-PTF-MV-FRP-VSL-00002B***
Component description	***Parent Vessel***

The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.

Materials of Construction	***SA 240 316 with maximum carbon content of 0.030%***
Design Life	***40 years***
Component Function and Life Cycle Description	***This vessel receives and stores waste in a batch transfer from off-site tanks. It shall be designed to be filled to the maximum content level over a period of one day. Additionally, this vessel will be subjected to fluid dynamic forces from the operation of the pulse jet mixers during the process of suspending the solids in the waste feed. This vessel is washed down not more than once per year.***

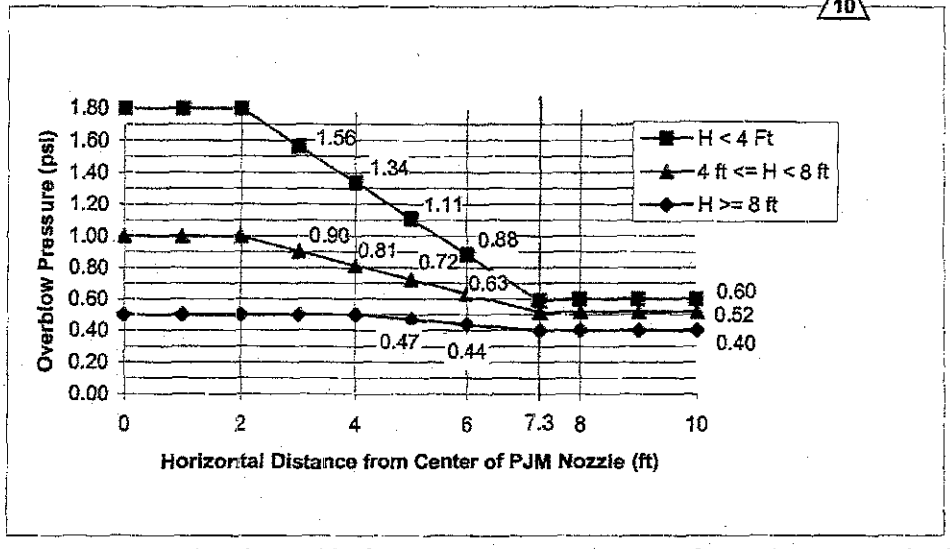
Load Type		Min	Max	Number of Cycles	Comment
Design Pressure	psig	***-2.5***	***15***	***10***	***Nominal assumption for testing***
Operating Pressure	psig	***-0.123***	***0***	***5100***	
Operating Temperature	°F	***50***	***215***	***5100***	
Contents Specific Gravity		***1.0***	***1.46***	***5100***	
Contents Level	inch	***32***	***402***	***5100***	***Liquid level measured from crown of bottom head***
Localized Features					
Nozzles					
Supports		***Same as vessel***		***Number of cycles same as vessel***	

Hydrodynamic Loading

In normal operation, pulse jet mixers discharge liquid into the parent vessel imposing a cyclical hydrodynamic load on all internal components. Occasionally, an upset condition designated 'overblow' causes air to be discharged from any single pulse jet mixer. All internal components shall be designed for the combination of the normal operational hydrodynamic loads and overblow loads, and this load combination is also to be assumed to act concurrently with seismic loads.

Normal operation imposes a cyclical load ranging between -0.05 and 0.12 psi in the radial direction and -0.01 to 0.10 psi in the vertical direction for 8.0 x 10^8 cycles. The hydrodynamic pressure applies across the projected area of the component. Positive hydrodynamic forces act in the radial, outward direction and the vertical, upward direction. Seller shall apply the radial load simultaneously in the radial direction and normal to the radial direction in the horizontal plane.

Overblow loads vary as a function of the distance from the center of the overblowing pulse jet mixer nozzle and the elevation 'H' above the overblowing pulse jet mixer nozzle up to the overflow level, as plotted in the form of overblow pressures: 10



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For all vessel internal components other than the overblowing pulse jet mixer, the overblow forces shall be applied a) in the vertical direction, and b) in the horizontal direction, radiating from the centerline of the overblowing pulse jet mixer. For the overblowing pulse jet mixer, the force shall be applied in the vertical upward direction only. The overblow force on all components, including the structures and supports, shall be calculated by applying the overblow pressure at the location of the nearest surface of the component and to the projected area of the component, facing the appropriate direction. The normal force component, specified for the normal pulse jet mixer operation condition, is not applicable to the overblow condition. Any single pulse jet mixer may overblow 1000 cycles. Reference CCN 125541 dated 07/27/05.

	MECHANICAL DATA SHEET: VESSEL	PLANT ITEM No. 24590-PTF-MV-FRP-VSL-00002B

Notes

Cycle increase: The Seller must increase the numbers of operational cycles given above by 10% to account for commissioning duty unless otherwise noted.

Equipment Cyclic Data Sheet

Component Plant Item Number:	*24590-PTF-MV-FRP-PJM-00017, 24590-PTF-MV-FRP-PJM-00018, 24590-PTF-MV-FRP-PJM-00019, 24590-PTF-MV-FRP-PJM-00020, 24590-PTF-MV-FRP-PJM-00021, 24590-PTF-MV-FRP-PJM-00022, 24590-PTF-MV-FRP-PJM-00023, 24590-PTF-MV-FRP-PJM-00024, 24590-PTF-MV-FRP-PJM-00025, 24590-PTF-MV-FRP-PJM-00026, 24590-PTF-MV-FRP-PJM-00027, 24590-PTF-MV-FRP-PJM-00028*
Component Description	*Pulse Jet Mixers (PJM)*

The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.

Materials of Construction	*SA 240 316 with maximum carbon content of 0.030%*
Design Life	*40 years*
Component Function and Life Cycle Description	*These PJMs are cyclically loaded using vacuum to fully fill the PJM with process liquid and compressed air to fully empty the PJM. The PJMs are contained within a parent vessel with varying liquid level. They shall be designed to cycle between the maximum pressure and the minimum pressure plus the external static head imposed by the parent vessel.* *The PJM supports shall be designed to cycle between the following loading conditions depending on the liquid level in the parent vessel:* ***Fully Buoyant*** *Parent vessel full and PJM empty* • *Design for buoyancy + PJM thrust – PJM weight* ***PJM Weight*** *Parent vessel full and PJM full or* *Parent vessel nearly empty and PJM empty* • *Design for PJM weight* ***Fully Loaded*** *Parent vessel nearly empty and PJM full* • *Design for PJM weight + liquid weight*

Load Type		Range		Number of Cycles	Comment
Design Pressure	psig	*FV*	*80*	*10*	*Nominal assumption for testing*
Operating Pressure	psig	*FV*	*30*	*8.0 X 10⁶*	*Operating pressure = 22 psig + 8 psig design margin*
Operating Temp	°F	*50*	*215*	*<100*	
Contents Specific Gravity		*1.0*	*1.46*	*<1000*	
Contents Level	inch	*Empty*	*Flooded*	*8.0 X 10⁶*	
PJM Thrust	lbf	*0*	*330*	*8.0 X 10⁶*	
Localized Features					
Supports		*Fully Buoyant*	*PJM Weight*	*3.31 X 10⁶*	*The parent vessel is operating at greater than 75% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.*
		Fully Buoyant	*Fully Loaded*	*1.38 X 10⁶*	*The parent vessel is operating at between 25 and 50% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.*
		PJM Weight	*Fully Loaded*	*3.31 X 10⁶*	*The parent vessel is operating at less than 25% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.*

Notes

Cycle increase: The Seller must increase the numbers of operational cycles given above by 10% to account for commissioning duty unless otherwise noted.

BECHTEL	**MECHANICAL DATA SHEET: VESSEL**	PLANT ITEM No. ***24590-PTF-MV-FRP-VSL-00002B***

Approval

Rev	Description	System Engr	Vessel Engr	Checked	Approved	Date
0	**Issue for Purchase**	Y. Hovanski	R. Simmons	C. Slater/CEC	S. Kirk	4/18/02
1	**Revised as Noted**	Y. Hovanski	R. Simmons	C. Corriveau	S. Kirk	6/02/02
2	**Revised Cyclical Data**	Y. Hovanski	R. Simmons	C. Slater	S. Kirk	8/29/02
3	**Revised as Noted, Deleted Charge Vessels**	Y. Hovanski	R. Simmons	CS / JJ	M.Hoffmann	12/13/02
4	**Revised per Note 5**	Y. Hovanski	R. Simmons	CS / JJ	M.Hoffmann	5/16/03
5	**Revised per Note 7**	Y. Hovanski	R. Simmons	CS / JJ	M.Hoffmann	11/3/03
6	**Added Black Cell Requirements**	R. Rider	R. Simmons	YH/CS/JJ	M. Hoffmann	4/5/04
7	**Added Material Specification for Internal Supports and Hydrodynamic Loads**	R. Rider	R. Simmons	YH/RT/JJ D. Adler	M. Hoffmann	6/23/04
8	**Revised Hydrodynamic Loading Criteria**	R. Rider	R. Simmons	YH/CS/JJ	M. Hoffmann	7/13/04
9	**Revised Hydrodynamic Loading Criteria**	R. Rider	R. Simmons	CS/JJ	M. Hoffmann	7/20/04
10	**Revised per Note 12 on sheet 2 of 5.**					10/28/05

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

MECHANICAL DATA SHEET: VESSEL

PLANT ITEM No. R10637277

24590-PTF-MV-FRP-VSL-00002C

Project:	**RPP-WTP**	P&ID:	**24590-PTF-M6-FRP-00002**
Project No:	**24590**	Calculations:	**24590-PTF-MVC-FRP-00001, 24590-PTF-MTC-FRP-00001** 10
Project Site:	**Hanford**	Vessel Drawing	**24590-PTF-M2-FRP-00003**
Description:	**Waste Feed Receipt Vessel**		

ISSUED BY RPP-WTP PDC

Reference Data

Charge Vessels (Tag Numbers)	
Pulsejet Mixers / Agitators (Tag Numbers)	**FRP-PJM-00029, FRP-PJM-00030, FRP-PJM-00031, FRP-PJM-00032, FRP-PJM-00033, FRP-PJM-00034, FRP-PJM-00035, FRP-PJM-00036, FRP-PJM-00001, FRP-PJM-00002, FRP-PJM-00003, FRP-PJM-00004**
RFDs/Pumps (Tag Numbers)	

Design Data

Quality Level		**See Drawing**	Fabrication Specs	**24590-WTP-3PS-MV00-T0001**		
Seismic Category		**SC-I**	Design Code	**ASME VIII Div 1**		
Service/Contents		**Radioactive Liquid**	Code Stamp	**Yes**		
Design Specific Gravity		**1.46**	NB Registration	**Yes**		
Maximum Design Volume	gal	**406,800 (Note 6)**	Weights (lbs)	Empty	Operating	Test
Total Volume	gal	**474,000 (Note 6)**	Estimated	**592,900**	**5,550,000 (Note 3)**	**4,550,000**
Viscosity	cP	**1.58 min / 21 max**	Actual ** 10	**589,800**	**5,370,000**	**4,540,000**
Environmental Qualification 10		**N/A**				

Inside Diameter	inch	**564**			Wind Design	**Not Required**	
Length/Height (TL-TL)	inch	**322**			Snow Design	**Not Required**	
		Vessel Operating	Vessel Design	Coil/Jacket Design	Seismic Design	**24590-WTP-3PS-SS90-T0001 24590-WTP-3PS-MV00-T0002**	
Internal Pressure	psig	**ATM**	**15**	**NA**	Seismic Base Moment ** 10	ft*lb	**46,070,000**
External Pressure	psig	**0.123**	**2.5**	**NA**	Postweld Heat Treat	**Not Required**	
Temperature	°F	**215**	**240**	**NA**	Corrosion Allowance	inch	**0.04 (Note 11)**
Min. Design Metal Temp.	°F	**5**			Hydrostatic Test Pressure *	psig	**19.5**

Materials of Construction

Component	Material	Minimum Thickness / Size	Containment
Top Head	**SA 240 316 (Note 2)**	**See Drawing**	**Auxiliary (Note 1)**
Shell	**SA 240 316 (Note 2)**	**See Drawing**	**Primary (Note 1)**
Bottom Head	**SA 240 316 (Note 2)**	**See Drawing**	**Primary (Note 1)**
Support (Skirt)	**SA 240 304 (Note 2)**	**See Drawing**	**N/A**
Internals	**SA 240 316 / SA 479 316 (Note 2)**	**See Drawing**	**Thermocouples Primary (Note 1)**
Pipe	**SA 312 TP316 Smls (Notes 2 & 7)**	**See Drawing**	**Note 1**
Forgings/ Bar stock	**SA 182 F316 (Note 2)**	**See Drawing**	**N/A**

Miscellaneous Data

Orientation	**Vertical**	Support Type	**Skirt**
Insulation Function	**Not Applicable**	Insulation Material	**Not Applicable**
Insulation Thickness (inch)	**Not Applicable**	Internal Finish	**Note 4**
		External Finish	**Welds Descaled as Laid**

* As determined by the vendor. 10

** The actual weights and seismic moment , shown herein are based on the original seismic data and these figures are subject to change, based on the new loads, obtained from the seismic redesign. 10

BECHTEL	MECHANICAL DATA SHEET: VESSEL	PLANT ITEM No. 24590-PTF-MV-FRP-VSL-00002C

Remarks

Note 1: *All welds forming part of the primary and auxiliary containments, including the nozzle attachment welds shall be subjected to 100% volumetric examination.*

Note 2: *Maximum carbon content of 0.030% for all welded components.*

Note 3: *Operating weight includes weight of liquid filled to top of overflow nozzle.*

Note 4: *Descale all internal welds as laid, grind smooth and blend all startsistops, high spots, and crevices, finish welds as required for NDE purposes.*

Note 5: *Revised PJM operating pressure and number of cycles per CCN 053810, specified content viscosity.*

Note 6: *Vessel volumes are approximate and do not account for manufacturing tolerances, nozzles, and displacement of internals.*

Note 7: *Welded pipe may be used for 14" NPS PJM supports per 24590-WTP-SDDR-PROC-03-0154.*

Note 8: *This vessel is located in a Black Cell.*

Note 9: *Contents of this document are Dangerous Waste Permit affecting (internal use only).*

Note 10: *Piping and piping support configurations shall be designed to preclude natural frequencies less than 7.0 Hz.*

Note 11: *Seller shall ensure that an additional 0.044" is available for erosion in the spherical portion of the bottom head and shall report the minimum thickness required for all specified loading conditions, exclusive of erosion and corrosion allowances.* CND 128549 10/25/05

Note 12: *Revision 10 of this data sheet incorporates the CCN 129149. The CCN added the words "in the form of overblow pressures", to the note shown above the overblow loads graph and further revised the note below the graph, as noted herein on sheet 3 of 5.*

10 *Added calculation 24590-PTF-MTC-FRP-00001 and Environmental Qualification on Sheet 1. Added note identified by ** on sheet 1.*

BECHTEL	**MECHANICAL DATA SHEET: VESSEL**	PLANT ITEM No. ***24590-PTF-MV-FRP-VSL-00002C***

Equipment Cyclic Data Sheet

Component Plant Item Number:	***24590-PTF-MV-FRP-VSL-00002-C***
Component Description	***Parent Vessel***

The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.

Materials of Construction	***SA 240 316 with maximum carbon content of 0.030%***
Design Life	***40 years***
Component Function and Life Cycle Description	***This vessel receives and stores waste in a batch transfer from off-site tanks. It shall be designed to be filled to the maximum content level over a period of one day. Additionally, this vessel will be subjected to fluid dynamic forces from the operation of the pulse jet mixers during the process of suspending the solids in the waste feed. This vessel is washed down not more than once per year.***

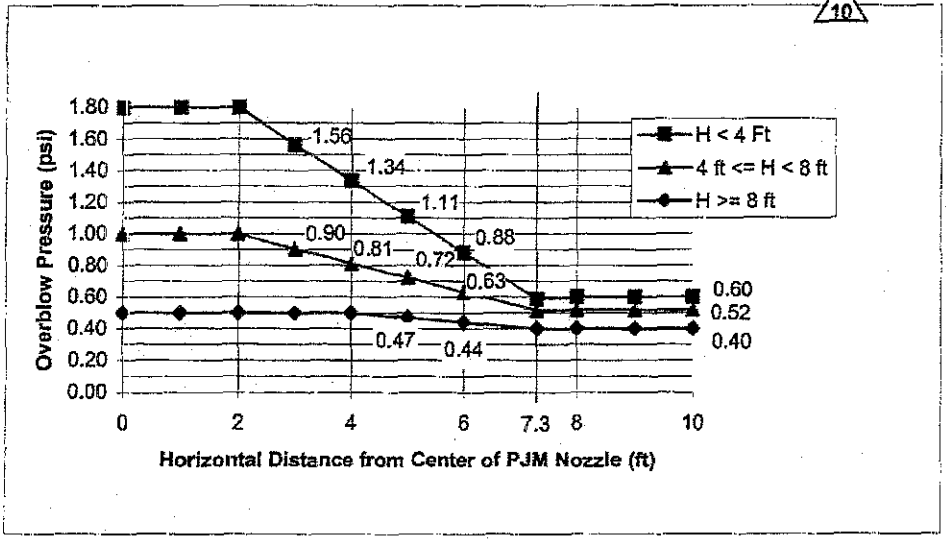
Load Type		Range		Number of Cycles	Comment
Design Pressure	psig	***-2.5***	***15***	***10***	***Nominal assumption for testing***
Operating Pressure	psig	***-0.123***	***0***	***5100***	
Operating Temperature	°F	***50***	***215***	***5100***	
Contents Specific Gravity		***1.0***	***1.46***	***5100***	
Contents Level	inch	***32***	***402***	***5100***	***Liquid level measured from crown of bottom head***
Localized Features					
Nozzles					
Supports		***Same as vessel***		***Number of cycles same as vessel***	

Hydrodynamic Loading

In normal operation, pulse jet mixers discharge liquid into the parent vessel imposing a cyclical hydrodynamic load on all internal components. Occasionally, an upset condition designated 'overblow' causes air to be discharged from any single pulse jet mixer. All internal components shall be designed for the combination of the normal operational hydrodynamic loads and overblow loads, and this load combination is also to be assumed to act concurrently with seismic loads.

Normal operation imposes a cyclical load ranging between -0.05 and 0.12 psi in the radial direction and -0.01 to 0.10 psi in the vertical direction for 8.0 x 10^6 cycles. The hydrodynamic pressure applies across the projected area of the component. Positive hydrodynamic forces act in the radial, outward direction and the vertical, upward direction. Seller shall apply the radial load simultaneously in the radial direction and normal to the radial direction in the horizontal plane.

Overblow loads vary as a function of the distance from the center of the overblowing pulse jet mixer nozzle and the elevation 'H' above the overblowing pulse jet mixer nozzle up to the overflow level as plotted in the form of overblow pressures: 10



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For all vessel internal components other than the overblowing pulse jet mixer, the overblow forces shall be applied a) in the vertical direction, and b) in the horizontal direction, radiating from the centerline of the overblowing pulse jet mixer. For the overblowing pulse jet mixer, the force shall be applied in the vertical upward direction only. The overblow force on all components, including the structures and supports, shall be calculated by applying the overblow pressure at the location of the nearest surface of the component and to the projected area of the component, facing the appropriate direction. The normal force component, specified for the normal pulse jet mixer operation condition, is not applicable to the overblow condition. Any single pulse jet mixer may overblow 1000 cycles. Reference CCN 125541 dated 07/27/05.

	MECHANICAL DATA SHEET: VESSEL	PLANT ITEM No. 24590-PTF-MV-FRP-VSL-00002C

Notes

Cycle increase: The Seller must increase the numbers of operational cycles given above by 10% to account for commissioning duty unless otherwise noted.

Equipment Cyclic Data Sheet

Component Plant Item Number:	***24590-PTF-MV-FRP-PJM-00001, 24590-PTF-MV-FRP-PJM-00002, 24590-PTF-MV-FRP-PJM-00003, 24590-PTF-MV-FRP-PJM-00004, 24590-PTF-MV-FRP-PJM-00029, 24590-PTF-MV-FRP-PJM-00030, 24590-PTF-MV-FRP-PJM-00031, 24590-PTF-MV-FRP-PJM-00032, 24590-PTF-MV-FRP-PJM-00033, 24590-PTF-MV-FRP-PJM-00034, 24590-PTF-MV-FRP-PJM-00035, 24590-PTF-MV-FRP-PJM-00036***
Component Description	***Pulse Jet Mixers***

The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.

Materials of Construction	***SA 240 316 with maximum carbon content of 0.030%***
Design Life	***40 years***
Component Function and Life Cycle Description	***These PJMs are cyclically loaded using vacuum to fully fill the PJM with process liquid and compressed air to fully empty the PJM. The PJMs are contained within a parent vessel with varying liquid level. They shall be designed to cycle between the maximum pressure and the minimum pressure plus the external static head imposed by the parent vessel.*** ***The PJM supports shall be designed to cycle between the following loading conditions depending on the liquid level in the parent vessel:*** ***Fully Buoyant*** — ***Parent vessel full and PJM empty*** • ***Design for buoyancy + PJM thrust – PJM weight*** ***PJM Weight*** — ***Parent vessel full and PJM full or Parent vessel nearly empty and PJM empty*** • ***Design for PJM weight*** ***Fully Loaded*** — ***Parent vessel nearly empty and PJM full*** • ***Design for PJM weight + liquid weight***

Load Type		Range		Number of Cycles	Comment
Design Pressure	psig	***FV***	***80***	***10***	***Nominal assumption for testing***
Operating Pressure	psig	***FV***	***30***	***8.0 X 10⁶***	***Operating pressure = 22 psig + 8 psig design margin***
Operating Temp	°F	***50***	***215***	***<100***	
Contents Specific Gravity		***1.0***	***1.46***	***<1000***	
Contents Level	inch	***Empty***	***Flooded***	***8.0 X 10⁶***	
PJM Thrust	lbf	***0***	***330***	***8.0 X 10⁶***	
Localized Features					
Supports		***Fully Buoyant***	***PJM Weight***	***3.31 X 10⁶***	***The parent vessel is operating at greater than 75% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.***
		Fully Buoyant	***Fully Loaded***	***1.38 X 10⁶***	***The parent vessel is operating at between 25 and 50% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.***
		PJM Weight	***Fully Loaded***	***3.31 X 10⁶***	***The parent vessel is operating at less than 25% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.***

Notes

Cycle increase: The Seller must increase the numbers of operational cycles given above by 10% to account for commissioning duty unless otherwise noted.

	MECHANICAL DATA SHEET: VESSEL	PLANT ITEM No. 24590-PTF-MV-FRP-VSL-00002C

Approval

Rev	Description	System Engr	Vessel Engr	Checked	Approved	Date
0	**Issue for Purchase**	Y. Hovanski	R. Simmons	C. Slater/CEC	S. Kirk	4/18/02
1	**Revised as Noted**	Y. Hovanski	R. Simmons	C. Corriveau	S. Kirk	6/02/02
2	**Revised Cyclical Data**	Y. Hovanski	R. Simmons	C. Slater	S. Kirk	8/29/02
3	**Revised as Noted, Deleted Charge Vessels**	Y. Hovanski	R. Simmons	CS / JJ	M.Hoffmann	12/13/02
4	**Revised per Note 5**	Y. Hovanski	R. Simmons	CS / JJ	M.Hoffmann	5/16/03
5	**Revised per Note 7**	Y. Hovanski	R. Simmons	CS / JJ	M.Hoffmann	11/3/03
6	**Added Black Cell Requirements**	R. Rider	R. Simmons	YH/CS/JJ	M. Hoffmann	4/5/04
7	**Added Material Specification for Internal Supports and Hydrodynamic Loads**	R. Rider	R. Simmons	YH/RT/JJ D. Adler	M. Hoffmann	6/23/04
8	**Revised Hydrodynamic Loading Criteria**	R. Rider	R. Simmons	YH/CS/JJ	M. Hoffmann	7/13/04
9	**Revised Hydrodynamic Loading Criteria**	R. Rider	R. Simmons	CS/JJ	M. Hoffmann	7/20/04
10	**Revised per Note 12 on sheet 2 of 5.**					10/28/05

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

MECHANICAL DATA SHEET: VESSEL

PLANT ITEM No. R10637278
24590-PTF-MV-FRP-VSL-00002D

Project:	**RPP-WTP**	P&ID:	**24590-PTF-M6-FRP-00002**
Project No:	**24590**	Calculations:	**24590-PTF-MVC-FRP-00001, 24590-PTF-MTC-FRP-00001** 10
Project Site:	**Hanford**	Vessel Drawing	**24590-PTF-M2-FRP-00004** MAS 6/25/05
Description:	**Waste Feed Receipt Vessel**		

Reference Data

ISSUED BY RPP-WTP PDC

Charge Vessels (Tag Numbers)	
Pulsejet Mixers / Agitators (Tag Numbers)	**FRP-PJM-00005, FRP-PJM-00006, FRP-PJM-00007, FRP-PJM-00008, FRP-PJM-00009, FRP-PJM-00010, FRP-PJM-00011, FRP-PJM-00012, FRP-PJM-00013, FRP-PJM-00014, FRP-PJM-00015, FRP-PJM-00016**
RFDs/Pumps (Tag Numbers)	

Design Data

Quality Level		**See Drawing**	Fabrication Specs	**24590-WTP-3PS-MV00-T0001**		
Seismic Category		**SC-I**	Design Code	**ASME VIII Div 1**		
Service/Contents		**Radioactive Liquid**	Code Stamp	**Yes**		
Design Specific Gravity		**1.46**	NB Registration	**Yes**		
Maximum Design Volume	gal	**406,800 (Note 6)**	Weights (lbs)	Empty	Operating	Test
Total Volume	gal	**474,000 (Note 6)**	Estimated	**592,900**	**5,550,000 (Note 3)**	**4,550,000**
Viscosity	cP	**1.58 min / 21 max**	Actual ** 10	**589,800**	**5,370,000**	**4,540,000**
Environmental Qualification 10		**N/A**				

Inside Diameter	inch	**564**			Wind Design	**Not Required**	
Length/Height (TL-TL)	inch	**322**			Snow Design	**Not Required**	
		Vessel Operating	Vessel Design	Coil/Jacket Design	Seismic Design	**24590-WTP-3PS-SS90-T0001** **24590-WTP-3PS-MV00-T0002**	
Internal Pressure	psig	**ATM**	**15**	**NA**	Seismic Base Moment ** 10	ft*lb	**46,070,000**
External Pressure	psig	**0.123**	**2.5**	**NA**	Postweld Heat Treat	**Not Required**	
Temperature	°F	**215**	**240**	**NA**	Corrosion Allowance	Inch	**0.04 (Note 11)**
Min. Design Metal Temp.	°F	**5**			Hydrostatic Test Pressure *	psig	**19.5**

Materials of Construction

Component	Material	Minimum Thickness / Size	Containment
Top Head	**SA 240 316 (Note 2)**	**See Drawing**	**Auxiliary (Note 1)**
Shell	**SA 240 316 (Note 2)**	**See Drawing**	**Primary (Note 1)**
Bottom Head	**SA 240 316 (Note 2)**	**See Drawing**	**Primary (Note 1)**
Support	**SA 240 304 (Note 2)**	**See Drawing**	**N/A**
Internals	**SA 240 316 / SA 479 316 (Note 2)**	**See Drawing**	**Thermocouples Primary (Note 1)**
Pipe	**SA 312 TP316 Smls (Notes 2 & 7)**	**See Drawing**	**Note 1**
Forgings/ Bar stock	**SA 182 F316 (Note 2)**	**See Drawing**	**N/A**

Miscellaneous Data

Orientation	**Vertical**	Support Type	**Skirt**
Insulation Function	**Not Applicable**	Insulation Material	**Not Applicable**
Insulation Thickness (inch)	**Not Applicable**	Internal Finish	**Note 4**
		External Finish	**Welds Descaled as Laid**

* As determined by the vendor. 10

** The actual weights and seismic moment , shown herein are based on the original seismic data and these figures are subject to change, based on the new loads, obtained from the seismic redesign. 10

	MECHANICAL DATA SHEET: VESSEL	PLANT ITEM No. 24590-PTF-MV-FRP-VSL-00002D

Remarks

Note 1: *All welds forming part of the primary and auxiliary containments, including the nozzle attachment welds shall be subjected to 100% volumetric examination.*

Note 2: *Maximum carbon content of 0.030% for all welded components.*

Note 3: *Operating weight includes weight of liquid filled to top of overflow nozzle.*

Note 4: *Descale all internal welds as laid, grind smooth and blend all starts/stops, high spots, and crevices, finish welds as required for NDE purposes.*

Note 5: *Revised PJM operating pressure and number of cycles per CCN 053810, specified content viscosity.*

Note 6: *Vessel volumes are approximate and do not account for manufacturing tolerances, nozzles, and displacement of internals.*

Note 7: *Welded pipe may be used for 14" NPS PJM supports per 24590-WTP-SDDR-PROC-03-0154.*

Note 8: *This vessel is located in a Black Cell.*

Note 9: *Contents of this document are Dangerous Waste Permit affecting (internal use only).*

Note 10: *Piping and piping support configurations shall be designed to preclude natural frequencies less than 7.0 Hz.*

Note 11: *Seller shall ensure that an additional 0.044" is available for erosion in the spherical portion of the bottom head and shall report the minimum thickness required for all specified loading conditions, exclusive of erosion and corrosion allowances.* QND 128549 #10/25/05

Note 12: *Revision 10 of this data sheet incorporates the CCN 129149. The CCN added the words "in the form of overblow pressures", to the note shown above the overblow loads graph and further revised the note below the graph, as noted herein on sheet 3 of 5. Added calculation 24590-PTF-M1C-FRP-00001 and Environmental Qualification on Sheet 1. Added the note identified by ** on sheet 1.*

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	MECHANICAL DATA SHEET: VESSEL	PLANT ITEM No. 24590-PTF-MV-FRP-VSL-00002D

Equipment Cyclic Data Sheet

Component Plant Item Number:	***24590-PTF-MV-FRP-VSL-00002D***
Component description	***Parent Vessel***

The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.

Materials of Construction	***SA 240 316 with maximum carbon content of 0.030%***
Design Life	***40 years***
Component Function and Life Cycle Description	***This vessel receives and stores waste in a batch transfer from off-site tanks. It shall be designed to be filled to the maximum content level over a period of one day. Additionally, this vessel will be subjected to fluid dynamic forces from the operation of the pulse jet mixers during the process of suspending the solids in the waste feed. This vessel is washed down not more than once per year.***

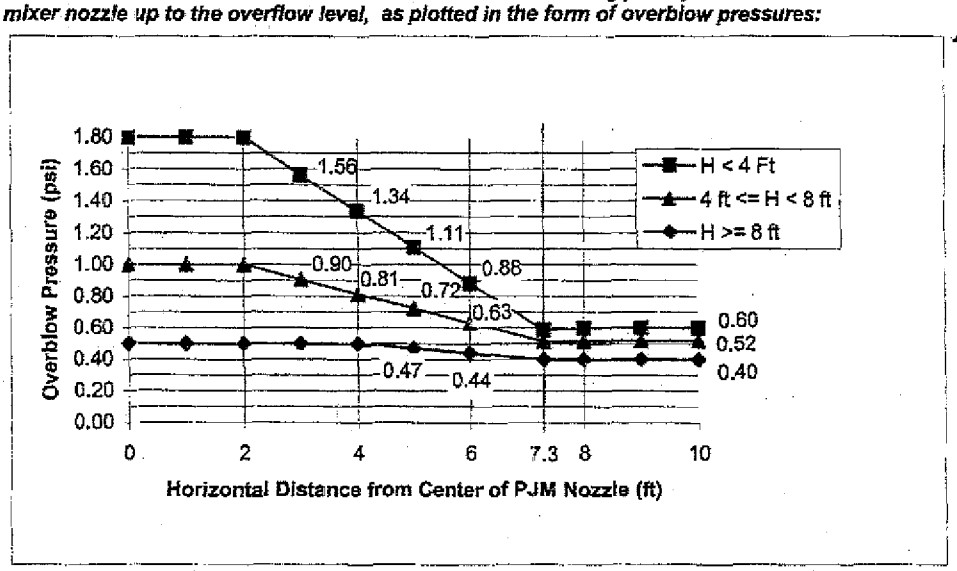
Load Type		Min	Max	Number of Cycles	Comment
Design Pressure	psig	***-2.5***	***15***	***10***	***Nominal assumption for testing***
Operating Pressure	psig	***-0.123***	***0***	***5100***	
Operating Temperature	°F	***50***	***215***	***5100***	
Contents Specific Gravity		***1.0***	***1.46***	***5100***	
Contents Level	inch	***32***	***402***	***5100***	***Liquid level measured from crown of bottom head***
Localized Features					
Nozzles					
Supports		***Same as Vessel***		***Number of cycles same as vessel***	

Hydrodynamic Loading

In normal operation, pulse jet mixers discharge liquid into the parent vessel imposing a cyclical hydrodynamic load on all internal components. Occasionally, an upset condition designated 'overblow' causes air to be discharged from any single pulse jet mixer. All internal components shall be designed for the combination of the normal operational hydrodynamic loads and overblow loads, and this load combination is also to be assumed to act concurrently with seismic loads.

Normal operation imposes a cyclical load ranging between -0.05 and 0.12 psi in the radial direction and -0.01 to 0.10 psi in the vertical direction for 8.0 x 10^8 cycles. The hydrodynamic pressure applies across the projected area of the component. Positive hydrodynamic forces act in the radial, outward direction and the vertical, upward direction. Seller shall apply the radial load simultaneously in the radial direction and normal to the radial direction in the horizontal plane.

Overblow loads vary as a function of the distance from the center of the overblowing pulse jet mixer nozzle and the elevation 'H' above the overblowing pulse jet mixer nozzle up to the overflow level, as plotted in the form of overblow pressures: 10



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For all vessel internal components other than the overblowing pulse jet mixer, the overblow forces shall be applied a) in the vertical direction, and b) in the horizontal direction, radiating from the centerline of the overblowing pulse jet mixer. For the overblowing pulse jet mixer, the force shall be applied in the vertical upward direction only. The overblow force on all components, including the structures and supports, shall be calculated by applying the overblow pressure at the location of the nearest surface of the component and to the projected area of the component, facing the appropriate direction. The normal force component, specified for the normal pulse jet mixer operation condition, is not applicable to the overblow condition. Any single pulse jet mixer may overblow 1000 cycles. Reference CCN 125541 dated 07/27/05.

	MECHANICAL DATA SHEET: VESSEL	PLANT ITEM No. 24590-PTF-MV-FRP-VSL-00002D

Notes

Cycle increase: The Seller must increase the numbers of operational cycles given above by 10% to account for commissioning duty unless otherwise noted.

Equipment Cyclic Data Sheet

Component Plant Item Number:	***24590-PTF-MV-FRP-PJM-00005, 24590-PTF-MV-FRP-PJM-00006, 24590-PTF-MV-FRP-PJM-00007, 24590-PTF-MV-FRP-PJM-00008, 24590-PTF-MV-FRP-PJM-00009, 24590-PTF-MV-FRP-PJM-00010, 24590-PTF-MV-FRP-PJM-00011, 24590-PTF-MV-FRP-PJM-00012, 24590-PTF-MV-FRP-PJM-00013, 24590-PTF-MV-FRP-PJM-00014, 24590-PTF-MV-FRP-PJM-00015, 24590-PTF-MV-FRP-PJM-00016***
Component Description	***Pulse Jet Mixers***

The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.

Materials of Construction	***SA 240 316 with maximum carbon content of 0.030%***
Design Life	***40 years***
Component Function and Life Cycle Description	***These PJMs are cyclically loaded using vacuum to fully fill the PJM with process liquid and compressed air to fully empty the PJM. The PJMs are contained within a parent vessel with varying liquid level. They shall be designed to cycle between the maximum pressure and the minimum pressure plus the external static head imposed by the parent vessel.*** ***The PJM supports shall be designed to cycle between the following loading conditions depending on the liquid level in the parent vessel:*** ***Fully Buoyant*** — ***Parent vessel full and PJM empty*** • ***Design for buoyancy + PJM thrust – PJM weight*** ***PJM Weight*** — ***Parent vessel full and PJM full or Parent vessel nearly empty and PJM empty*** • ***Design for PJM weight*** ***Fully Loaded*** — ***Parent vessel nearly empty and PJM full*** • ***Design for PJM weight + liquid weight***

Load Type		Range		Number of Cycles	Comment
Design Pressure	psig	***FV***	***80***	***10***	***Nominal assumption for testing***
Operating Pressure	psig	***FV***	***30***	***8.0 X 10^6***	***Operating pressure = 22 psig + 8 psig design margin***
Operating Temp	°F	***50***	***215***	***<100***	
Contents Specific Gravity		***1.0***	***1.46***	***<1000***	
Contents Level	inch	***Empty***	***Flooded***	***8.0 X 10^6***	
PJM Thrust	lbf	***0***	***330***	***8.0 X 10^6***	
Localized Features					
Supports		***Fully Buoyant***	***PJM Weight***	***3.31 x 10^5***	***The parent vessel is operating at greater than 75% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.***
		Fully Buoyant	***Fully Loaded***	***1.38 x 10^5***	***The parent vessel is operating at between 25 and 50% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.***
		PJM Weight	***Fully Loaded***	***3.31 x 10^5***	***The parent vessel is operating at less than 25% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.***

Notes

Cycle increase: The Seller must increase the numbers of operational cycles given above by 10% to account for commissioning duty unless otherwise noted.

BECHTEL	**MECHANICAL DATA SHEET: VESSEL**	PLANT ITEM No. ***24590-PTF-MV-FRP-VSL-00002D***

Approval

Rev	Description	System Engr	Vessel Engr	Checked	Approved	Date
0	**Issue for Purchase**	Y. Hovanski	R. Simmons	C. Slater/CEC	S. Kirk	4/18/02
1	**Revised as Noted**	Y. Hovanski	R. Simmons	C. Corriveau	S. Kirk	6/02/02
2	**Revised Cyclical Data**	Y. Hovanski	R. Simmons	C. Slater	S. Kirk	8/29/02
3	**Revised as Noted, Deleted Charge Vessels**	Y. Hovanski	R. Simmons	CS / JJ	M.Hoffmann	12/13/02
4	**Revised per Note 5**	Y. Hovanski	R. Simmons	CS / JJ	M.Hoffmann	5/16/03
5	**Revised per Note 7**	Y. Hovanski	R. Simmons	CS / JJ	M.Hoffmann	11/3/03
6	**Added Black Cell Requirements**	R. Rider	R. Simmons	YH/CS/JJ	M. Hoffmann	4/5/04
7	**Added Material Specification for Internal Supports and Hydrodynamic Loads**	R. Rider	R. Simmons	YH/RT/JJ D. Adler	M. Hoffmann	6/23/04
8	**Revised Hydrodynamic Loading Criteria**	R. Rider	R. Simmons	YH/CS/JJ	M. Hoffmann	7/13/04
9	**Revised Hydrodynamic Loading Criteria**	R. Rider	R. Simmons	CS/JJ	M. Hoffmann	7/20/04
10	**Revised per Note 12 on sheet 2 of 5.**					10/28/05

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

Attachment 2
07-ESQ-108

Bechtel National, Inc. Certification Statement

Bechtel National, Inc. Certification

The following certification statement is provided consistent with Contract No. DE-AC27-01RV14136, Section H.26, Environmental Permits, paragraph (g) for the submittal of the Hanford Facility Resource Conservation and Recovery Act Permit Modification Notification Form 24590-PTF-PCN-ENV-06-018

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

W. S. Elkins
Project Director

6/28/07
Date